

Claims

- [c1] [c1] What Is Claimed Is:
1. An antenna adapted for a logging tool, comprising:
 - a core;
 - the core including an electrical conductor disposed thereon such that the antenna has a first magnetic dipole moment substantially perpendicular to a longitudinal axis of the core.
- [c2] 2. The antenna of claim 1 wherein the antenna is adapted to transmit or receive electromagnetic energy.
- [c3] 3. The antenna of claim 2 wherein the core consists of a dielectric material.
- [c4] 4. The antenna of claim 3 wherein the conductor is disposed on the outer surface of the core.
- [c5] 5. The antenna of claim 4 wherein the conductor is plated onto the core.
- [c6] 6. The antenna of claim 5 wherein the core includes an arcuate shaped outer surface.
- [c7] 7. The antenna of claim 6 wherein the core forms a surface of revolution.
- [c8] 8. The antenna of claim 7 wherein the core forms a cylinder having open ends.
- [c9] 9. The antenna of claim 4 wherein the conductor consists of a conductive material deposited on the core.
- [c10] 10. The antenna of claim 9 wherein the core includes an arcuate shaped outer surface.
- [c11] 11. The antenna of claim 10 wherein the core forms a surface of revolution.
- [c12] 12. The antenna of claim 11 wherein the core forms a cylinder having open ends.
- [c13] 13. The antenna of claim 4 further comprising a second electrical conductor disposed on the core such that the antenna has a second magnetic dipole moment substantially perpendicular to the longitudinal axis of the core.

- [c14] 14.The antenna of claim 13 wherein the second magnetic dipole moment is substantially perpendicular to the first magnetic dipole moment.
- [c15] 15.The antenna of claim 13 wherein the second conductor is plated onto the core.
- [c16] 16.The antenna of claim 13 wherein the second conductor consists of a conductive material deposited on the core.
- [c17] 17.The antenna of claim 13 further comprising another independent electrical conductor disposed on the core, the conductor adapted to alter the first or second magnetic moment.
- [c18] 18.The antenna of claim 17 wherein the independent conductor forms a closed loop.
- [c19] 19.The antenna of claim 17 wherein the independent conductor forms a disk.
- [c20] /c2/20.A well logging tool comprising:
a support having at least one antenna mounted thereon; and
electrical circuitry coupled to the at least one antenna,
wherein the at least one antenna comprises a dielectric core, the core having an electrical conductor disposed thereon to form a conductive path, the conductive path arranged to have a first magnetic dipole moment substantially perpendicular to a longitudinal axis of the core.
- [c21] 21.The logging tool of claim 20 wherein the antenna is adapted to transmit or receive electromagnetic energy.
- [c22] 22.The logging tool of claim 21 wherein the conductor is plated onto the core.
- [c23] 23.The logging tool of claim 22 wherein the core forms a surface of revolution.
- [c24] 24.The logging tool of claim 23 wherein the core forms a cylinder having open ends.
- [c25] 25.The logging tool of claim 21 wherein the conductor consists of a conductive material deposited on the core.

- [c26] 26.The logging tool of claim 25 wherein the core forms a surface of revolution.
- [c27] 27.The logging tool of claim 26 wherein the core forms a cylinder having open ends.
- [c28] 28.The logging tool of claim 20 further comprising a second electrical conductor disposed on the core to form a conductive path, the conductive path arranged to have a second magnetic dipole moment substantially perpendicular to the longitudinal axis of the core.
- [c29] 29.The logging tool of claim 28 wherein the second magnetic dipole moment is substantially perpendicular to the first magnetic dipole moment.
- [c30] 30.The logging tool of claim 28 wherein the second conductor is plated onto the core.
- [c31] 31.The logging tool of claim 28 wherein the second conductor consists of a conductive material deposited on the core.
- [c32] 32.The logging tool of claim 28 further comprising another independent electrical conductor disposed on the core, the independent conductor adapted to alter the first or second magnetic moment.
- [c33] 33.The logging tool of claim 32 wherein the independent conductor forms a closed loop.
- [c34] 34.The logging tool of claim 32 wherein the independent conductor forms a disk.
- [c35] 35.The logging tool of claim 21 wherein the support is adapted for disposal within a well bore on one of a wireline, a drill collar, or coiled tubing.
- [c36] 36.A method of producing an antenna for a logging tool, comprising:
(a) disposing an electrical conductor on a dielectric core, the conductor forming a conductive path arranged to have a first magnetic dipole moment perpendicular to a longitudinal axis of the core; and
(b) adapting the electrical conductor to be coupled with independent circuitry.

- [c37] 37.The method of claim 36 wherein the antenna is adapted to transmit or receive electromagnetic energy.
- [c38] 38.The method of claim 37 wherein step (a) comprises plating the conductor onto the core.
- [c39] 39.The method of claim 38 wherein the core forms a surface of revolution adapted to be placed in juxtaposition with a curved surface.
- [c40] 40.The method of claim 39 wherein the core forms a cylinder having open ends.
- [c41] 41.The method of claim 37 wherein step (a) comprises depositing a conductive material onto the core to form the conductor.
- [c42] 42.The method of claim 41 wherein the core forms a surface of revolution adapted to be placed in juxtaposition with a curved surface.
- [c43] 43.The method of claim 42 wherein the core forms a cylinder having open ends.
- [c44] 44.The method of claim 36 further comprising disposing a second electrical conductor on the core such that the antenna has a second magnetic dipole moment substantially perpendicular to the longitudinal axis of the core.
- [c45] 45.The method of claim 44 wherein the second magnetic dipole moment is substantially perpendicular to the first magnetic dipole moment.
- [c46] 46.The method of claim 44 wherein disposing the second conductor comprises plating the conductor onto the core.
- [c47] 47.The method of claim 44 wherein disposing the second conductor comprises depositing a conductive material onto the core to form the conductor.
- [c48] 48.The method of claim 44 further comprising disposing another independent electrical conductor on the core, the conductor adapted to alter the first or second magnetic moment.
- [c49] 49.The method of claim 48 wherein the independent conductor forms a closed loop.

[c50]

50.The method of claim48 wherein the independent conductor forms a disk.